

CLAIMS

We claim:

1. A method comprising:
heating polymer material formed on a substrate to a temperature at least as high as a Curie temperature of the polymer material;
aligning a plurality of domains of the heated polymer material in a direction relative to a surface of the substrate; and
cooling the temperature of the polymer material while maintaining the alignment of the domains of the polymer material.
2. The method of Claim 1, further comprising:
forming the polymer material on the substrate in a chamber prior to heating the polymer material.
3. The method of Claim 1, wherein the polymer material comprises:
poly(vinylidene fluoride-trifluoroethylene).
4. The method of Claim 1, wherein heating the polymer material comprises:
at least one of directly applying heat to at least one of the polymer material and the substrate with a heating element, and creating ambient heat within a chamber in which the substrate and polymer material are disposed.
5. The method of Claim 4, wherein heating is performed for between approximately 2 and 600 minutes and at a temperature between approximately 130° and 150° Celsius.
6. The method of Claim 1, wherein aligning comprises:
exposing the polymer material to an electric field.

7. The method of Claim 6, wherein the electric field comprises:

an electric field of at least approximately 40 megavolts per meter.

8. The method of Claim 6, wherein exposing comprises:
at least one of creating an electric field with at least two plates of a capacitor and inducing an electric field.

9. The method of Claim 1, wherein the direction of alignment comprises:

a direction approximately perpendicular to the surface of the substrate.

10. The method of Claim 1, wherein the alignment is performed until at least approximately 75 percent of the polymer material is in a ferroelectric phase.

11. The method of Claim 1, wherein aligning is maintained until the temperature of the polymer material is below the Curie temperature of the polymer material.

12. A method comprising:

heating polymer material formed on a substrate to a temperature at least as high as a Curie temperature of the polymer material;

applying an electric field to the heated polymer material to align a plurality of domains of the polymer material in a direction relative to a surface of the substrate;

cooling the temperature of the polymer material while maintaining application of the electric field to the polymer material.

13. The method of Claim 12, further comprising:
forming the polymer material on the substrate in a chamber prior to heating the polymer material.

14. The method of Claim 12, wherein the polymer material comprises:

poly(vinylidene fluoride-trifluoroethylene).

15. The method of Claim 12, wherein heating the polymer material comprises:

at least one of directly applying heat to at least one of the polymer material and the substrate with a heating element, and creating ambient heat within a chamber in which the substrate and polymer material are disposed.

16. The method of Claim 15, wherein heating is performed for between approximately 2 and 600 minutes and at a temperature between approximately 130° and 150° Celsius.

17. The method of Claim 12, wherein the electric field comprises:

an electric field of at least approximately 40 megavolts per meter.

18. The method of Claim 12, wherein applying the electric field comprises:

at least one of creating an electric field with at least two plates of a capacitor and inducing an electric field.

19. The method of Claim 12, wherein the direction of alignment comprises:

a direction approximately perpendicular to the surface of the substrate.

20. The method of Claim 12, wherein the electric field is applied until at least approximately 75 percent of the polymer material is in a ferroelectric phase.

21. The method of Claim 12, wherein applying is maintained until the temperature of the polymer material is below the Curie temperature of the polymer material.

22. An apparatus comprising:
a substrate; and
a polymer material formed on a surface of the substrate, the polymer material having a plurality of domains that are aligned in a direction relative to the surface of the substrate.

23. The apparatus of Claim 22, wherein the polymer material comprises:

poly(vinylidene fluoride-trifluoroethylene).

24. The apparatus of Claim 22, wherein the direction of alignment comprises:

a direction approximately perpendicular to the surface of the substrate.

25. The apparatus of Claim 22, wherein at least approximately 75 percent of the polymer material is in a ferroelectric phase.

26. A system comprising:
flash memory comprising
a substrate, and
a polymer material formed on a surface of the substrate, the polymer material having a plurality of domains that are aligned in a direction relative to the surface of the substrate.

27. The system of Claim 26, wherein the polymer material comprises:

poly(vinylidene fluoride-trifluoroethylene).

28. The system of Claim 26, wherein the direction of alignment comprises:

a direction approximately perpendicular to the surface of the substrate.

29. The system of Claim 26, wherein at least approximately 75 percent of the polymer material is in a ferroelectric phase.